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ABSTRACT

This study describes the design and implementation of the Automated Library Information System (ALIS) as the pilot project for the Dallas County Community College District's Automated Information Resources System (AIRS). The focus of the report is the online circulation subsystem of ALIS, which was implemented in September 1977 as phase one of AIRS, and includes the historical background and philosophy surrounding the decision to convert from the present offline system to a fully automated one; a brief description of how the system's software and hardware operate and system capabilities; and a practical evaluation of the system, including problems experienced in the transition period. This is not intended as a comprehensive evaluation: the system had been in operation less than nine months when this paper was written.
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AN AUTOMATED ONLINE CIRCULATION SUBSYSTEM: THE DALLAS
COUNTY COMMUNITY COLLEGE DISTRICT'S PILOT PROJECT

A PAPER

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF LIBRARY SCIENCE
IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY

SCHOOL OF
LIBRARY SCIENCE

"PERMISSION TO REPRODUCE THIS
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John J. Miniter

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC) AND
USERS OF THE ERIC SYSTEM."

BY

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We hereby recommend that the paper prepared under
our supervision by Sarah Ann Ferguson
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PREFACE

The parameters governing the direction of this study are to describe the design and implementation of the Automated Library Information System (ALIS) as the pilot project for the Dallas County Community College District's Automated Information Resources System (AIRS).

The objective is not to evaluate ALIS as compared to other automated library systems, but rather to inform the library community of the emergence of a new vendor. Because of the uncompleted operations within the system, a comprehensive evaluation of the project cannot be rendered at this time.

Throughout the paper, the terms "online" and "offline" will be used as one unhyphenated word. The authority for this decision is the American National Standards Institute. The concept of online systems has been in existence for more than fifteen years.

The emergence of a new vendor in the library community is a noteworthy event. Thus, the pilot project's experiences are of importance and interest to the library profession.

TABLE OF CONTENTS

PREFACE	iii
INTRODUCTION	1
Chapter	
I. AUTOMATION: FOUR GENERATIONS OF PROGRESS . . .	3
II. DALLAS COUNTY COMMUNITY COLLEGE DISTRICT: PROFILE	10
Introduction	10
Learning Resources Center	11
III. AUTOMATED CIRCULATION SYSTEMS	16
Automated Circulation Systems	17
District Circulation Systems	20
IV. AUTOMATED LIBRARY INFORMATION SYSTEM	23
Systems Development	25
Future Developments	28
Hardware and Software Capabilities	29
OCR Technology	32
OCR Wand	33
Functions	34
Charge	35
Discharge	37
Renewals	38
Hold Procedure	38
Reserves	39
Overdue Control	39
Inquiry of Files	40
Branch-to-Branch Communication	41
Temporary Cataloging	41
System Reports	41
Mailbox	42

Blocks	42
Additional Functions	42
Cataloging	43
V. IMPLEMENTATION OF THE CIRCULATION SUBSYSTEM . .	44
VI. EVALUATION AND CONCLUSION	56
SELECTED BIBLIOGRAPHY	63

INTRODUCTION

In September 1977, the Dallas County Community College District (DCCCD) implemented phase one of its Automated Information Resources System (AIRS). AIRS is the pilot project for DataPhase Systems' Automated Library Information System (ALIS). Phase one, an automated online circulation subsystem is composed of a centrally located minicomputer, on-site cathode ray tube (CRT) displays at the six campuses and an OCR Wand Scanner used initially for the circulating and discharging of materials from the Learning Resources Centers (LRC) within the District.

As automation and especially online facilities become more economical and cost efficient, more and more libraries are converting from present systems to fully automated ones. It was felt that the experiences encountered in the planning, development, and operation of the new system warranted study for further use by other institutions planning such an endeavor.

To understand how libraries have arrived at this present level of rapid communication, some background information on library automation will be given, from the early periods of mechanization to the online facilities now available. The bulk of the study will feature the

DCCCD's online circulation subsystem. Included will be (1) the historical background and philosophy surrounding the decision to convert from the present offline system to a fully automated one; (2) a brief description of how the system's software and hardware operates and the system capabilities; and (3) a practical evaluation of the system including problems experienced in the transition period.

This study is not designed to dictate methods of conversion for other libraries. Rather, it is an attempt to describe how one college system has sought to improve and update the routine, often mechanical, operations found in a library, beginning with the circulation system.

At the time this paper is being written, the system has been in operation less than nine months. Because of the debugging process, only three functions have been made available to the college campuses. The other functions are to be completed by the end of May 1978. From this point on continual evaluation of the programs and operation will be done in hopes of eliminating problems which may appear.

CHAPTER I

AUTOMATION: FOUR GENERATIONS OF PROGRESS

For the past twenty-five years the library community has been implementing a revolutionary idea which appeared in the early fifties: the use of computer technology to improve library service. The library community is now embarking upon what could be termed the fourth generation of automation.¹ To gain a better understanding of the implications of this latest trend, it is necessary to look briefly at the past three generations and outline the accomplishments and failures of the early pioneering efforts.

The early endeavors toward library computerization were located in the newly created engineering libraries of the 1950s. The earliest applications were to benefit the user by means of machine searches of subject indexes employing the technique of post-coordination of the Uniterm

¹Audrey N. Grosch, "Approaches to Library Automation: Past, Present, and Future Library Computer Systems Design," Automated Activities in Health Science Libraries, vol. 1, issue 2 (Tempe, Arizona: The LARC Association, Inc., 1975): 10.

card file.¹ The U.S. Naval Ordnance Test Station System (NOTS), which mimicked the Uniterm system, provided the user additional information on the status of the selected documents and produced a printout of document numbers chosen. The General Electric system went one step further by providing a printout of the author and title chosen plus an abstract of the report.² This first generation of computer application proved automation was conceivable but as yet unattainable for the average library.

As the first generation established itself as the pacesetter in computer adaptation, the second generation emerged as the era of mechanization. This highly mechanized period saw a flourish of independent localized attempts at library automation. It was an "exciting, creative, and glamorous job" of "programming, implementing, and sometimes actually operating the computer."³

The early goals of mechanization were to perform the repetitive routine library tasks such as catalog production, circulation, serials control, and acquisition of

¹Frederick G. Kilgour, "History of Library Computerization," Journal of Library Automation 3 (September 1970): 218.

²Ibid., pp. 219-20.

³Richard De Gennaro, "Library Automation: The Second Decade," Journal of Library Automation 8 (March 1975): 4.

materials. The literature abounds with information regarding these early trial and error projects.

Notable successes included the first catalog cards and subject bibliographies produced from a single machine readable record at the Douglas Aircraft Company in 1960 and a computerized circulation system which used 80-column punched cards into which were punched bibliographic data and borrower information. The Library of the University of California, San Diego, initiated the first computerized serials control system. This system used a prepunched card for receiving journal issues. Outputs consisted of a complete holdings list, current receipts list, binding lists, claims and expiration of subscription lists. In 1965, the Kansas Union List of Serials appeared as the first computerized union list to contain the holdings of several institutions. Pennsylvania State University Library shortened the acquisitions process by the use of the punched card. Each time the status of an item changed a corresponding card was sent to the data processing center. From this a compact printout was provided.¹

The rapid advancement and pioneering projects in libraries paralleled the growth in computer technology. As

¹Kilgour, pp. 220-24.

components became more plentiful, institutions and organizations continued to experiment and design new modes of operation. Two highly publicized projects exemplify this point. One was the Florida Atlantic University project and the other was Project INTREX at the Massachusetts Institute of Technology.

Florida Atlantic (1964) was a newly established university committed to the philosophy of providing the best educational advancements through computer technology. The library, in agreement with this philosophy, opted for a totally computerized library environment in lieu of the more conventional card catalog and other manual methods of operation. The project proved to be far too premature and was abandoned. However, "the national and even international publicity generated by this project created tremendous interest, incentive, and pressure for other libraries to enter the field."¹

Project INTREX sought to create a new kind of library which would parallel existing libraries and eventually surpass them rather than attempt to automate established ones. The project was systematically developed and managed and in 1974 declared its goals had been achieved.

¹Richard De Gennaro, "Library Automation: Changing Patterns and New Directions," Library Journal 101 (January 1976): 176.

The impact had been less than its promise and the practicality was far outweighed by the expense. "In its highly sophisticated way INTREX may have been just as ill-conceived and premature as the more amateurish Florida Atlantic initiative."¹

One of the problems associated with being among the early leaders in the automation field was that as technology advanced many libraries found themselves frozen into an obsolete system.² For those libraries which waited, an alternative approach appeared in the early 1970s: cooperative networks. The ease with which libraries can participate in these chains has been "chiefly responsible for the change in direction of library automation from the development of local systems for individual libraries that characterized the sixties to the participation in cooperative networks that is dominating the seventies."³

The leader in this third generation movement toward cooperative networks has been the Ohio College Library Center (OCLC). The OCLC network serves Ohio in addition to eleven other regional networks. The popularity of the system stems from the ease with which libraries can join

¹Ibid., p. 176.

²Ibid., p. 177.

³Ibid., p. 180.

the networks and receive the benefits of automation without attempting to develop a system of their own. The significance of OCLC cannot be overstated. The system has demonstrated the willingness on the part of many libraries and even consortia to use data bases of its kind. This "signals a new maturity in library automation where the focus is on the product rather than on the process or the glamour of developing new systems."¹

This "new maturity" might well signify the emergence of a fourth generation of library automation. The chief characteristics of this period could be the increased purchasing of packaged minicomputer systems from commercial vendors. No longer would the large in-house automation program and staff be essential for the implementation of new projects.² Another development likely to become more feasible will be the transfer of systems among libraries.³ For instance Ohio State University's online circulation system will be installed at Purdue University and the State University of New York System.⁴ Therefore, as budgets

¹Ibid.

²De Gennaro, "Library Automation: The Second Decade," p. 4.

³Ibid.

⁴De Gennaro, "Library Automation: Changing Patterns and New Directions," p. 183.

tighten and the need for better facilities increase, libraries may be willing to accept someone else's system rather than risk development of their own.

Since the first application of computers some twenty-five years ago, library automation has seen the establishment and passing of localized systems. However, it was upon this highly experimental base that the knowledge of this decade came to fruition. The next decade could well see a marriage of the cooperative network with the in-house library minicomputer capable of interfacing with a national library network for the sharing of bibliographic data and library resources.¹

¹Ibid.

CHAPTER II

DALLAS COUNTY COMMUNITY COLLEGE

DISTRICT: PROFILE

Introduction

Since the commencement of the Dallas County Community College District (DCCCD) in 1965, the predominant philosophy within the organizational structure has been one of innovation. The educators designed the curriculum and supporting bodies to incorporate the technology then available. Over ten years later, despite personnel changes and composition, this philosophy of creativity and innovation is still pre-eminent in the thinking and goals of the district as it moves into its second decade.

The DCCCD is composed of six campuses strategically located about the county. The District serves not only the residents of Dallas County but the surrounding counties as well. In August 1977, the District opened two of the three last projected campuses. With the completion of the seventh campus in August 1978, the DCCCD master plan for colleges located throughout the county will be complete.

The DCCCD is composed of a highly diversified student body ranging from students directly out of high

school, many of whom are employed, to adults entering college for the first time. Because of the objective to serve all aspects of the community, noncredit courses are offered through the Community Service program available to all age groups within the area.

Enrollment statistics for the 1976-77 school term, with only four colleges open, indicated the District was accessible to 33,386 students. For the same period the Education Directory indicated that the DCCCD's enrollment was equal to, if not greater than, many of the four year institutions across the nation. For example, North Texas State University had 16,717; the University of Houston (main campus) had 34,766; the University of North Carolina at Chapel Hill indicated 20,615; and the University of Oklahoma at Norman had 23,995.¹ The figures for Spring 1978 reveal that the District now serves 34,466 students.

Learning Resources Center

One of the supportive internal arms within each campus is the Learning Resources Center (LRC). The LRC is composed of a Center for Independent Study (library), Classroom Resources, and Instructional Development. The

¹Arthur Podolsky and Carolyn R. Smith, Education Directory: Colleges and Universities, 1976-77 (Washington, D.C.: U.S. Government Printing Office, 1977).

LRC, whose philosophy reflects that of the District, emphasizes the use of new technology and services available to enhance the curriculum within each college. The strongest emphasis is on the learner.

The LRC paralleled the District's philosophy of an innovative approach to learning. The first LRC located on the El Centro campus in 1965 broke from the more traditional approaches of library organization and management in favor of the pioneering trends in library automation advocated in the literature. The early years were highly experimental ones, testing new ideas as they surfaced within the library community. As with other pioneers in the field, some of the ideas implemented succeeded while others were abandoned and were replaced by superior ones as the technology improved.

One of the first significant departures from the traditional pattern was the use of the Library of Congress Classification scheme generally used in large, research oriented libraries. As the literature indicated, the trend in college and university libraries was towards the standardization of LC and away from the individualism of Dewey. Although the move was a revolutionary one for a community or junior college to make in 1965, by 1971 the impetus had shifted toward LC and academic libraries across the country

began the conversion process.¹ The farsightedness of the LRC had eliminated a dual collection commonplace among most other libraries.²

A second major departure from the traditional structure was the absence of a card catalog. The early designers felt it was a cumbersome obstacle in the library's creative design; therefore, the computer-produced book catalog was elected. This proved to be a burdensome operation and extremely costly.³ In 1969 the book catalog was superceded by the microfilm catalog. The idea again was revolutionary and existed in only a handful of institutions. The microfilm catalog was produced by the "micromation" technique. A master record of the library's holdings was stored on magnetic tape and through a special conversion process a 16mm microfilm was produced and installed on a special cartridge.⁴ The obvious advantage was a reduction in cost. A cartridge could be produced for only a fraction

¹Robert L. Mowery, "The 'Trend to LC' in College and University Libraries," Library Resources and Technical Services 19 (Fall 1976): 391.

²Richard M. Dougherty, "The Realities of Reclassification," College and Research Libraries 28 (July 1967): 259.

³Fritz Veit, The Community College Library (Westport, Ct.: Greenwood Press, 1975), p. 95.

⁴*Ibid.*, p. 95.

of the cost of a book catalog. In addition, it offered greater ease for producing supplements.

Although less expensive to produce, the disadvantages of the cartridge became apparent all too soon. As the library's holdings increased, so too did the amount of information on the single cartridge. The data crowded too close to the end of the reel and was subject to unwinding completely. As the frequency of this mishap increased, an alternative method was sought.

The solution proved to be COM--Computer Output Microform. With this method the shortened bibliographic information can be stored on magnetic tape, output as microfiche by a contracted service firm and subsequently updated every two months.¹ "Fiche" requires less complicated equipment and thus poses little maintenance problems. It can be easily duplicated for distribution within other segments of the LRC.

The most far-reaching aspect was the production of the magnetic tape of the master holdings for each LRC. As the District converts to an online automated information system one of the most time-consuming steps has been eliminated; namely, the conversion of the holdings into a

¹Mickey M. Sparkman, "Letters to the Editor," College and Research Libraries 34 (May 1973): 225.

machine readable format. From the District's magnetic tape, data can be input to the computer with the output being the master holdings file.

Another innovative facet was the automated circulation system. The original system was the IBM 357 Data Collection System using a borrower identification card, punched book card, and a transaction card. The second system was the Standard Register Source Record Punch. Both of these systems will be discussed in more detail in a later chapter.

As has been indicated, the Learning Resources Center within the DCCCD has been a pacesetter for change within the library community. The objective has been to incorporate the technology currently available in its operation. The daringness predominant in the early years is still evident in 1978. Because of this philosophy the Dallas County Community College District has embarked upon the AIRS Project: an Automated Information Resources System.

CHAPTER III

AUTOMATED CIRCULATION SYSTEMS

Libraries have been circulating materials for many years. However, the methods of circulation vary tremendously among libraries. The traditional view of circulation control is to keep a record of materials removed from the library by a patron. The principal procedures involve charging, discharging, the determination and mailing of overdue notices, reserves, and file maintenance.¹

With the aid of advanced technology in computer science, this traditional view has been broadened to encompass all the activities related to library materials. These activities include not only the traditional ones, but also assistance to patrons of a "quasi-catalog-reference" realm and collection and analysis of statistical data necessary for weeding and further development of the collection.² But the design of any circulation system

¹Barbara Evans Markuson, "Automated Circulation Control Systems: An Overview of Commercially Vended Systems," Library Technology Reports, July and September 1975, p. 6.

²Ibid.

is dependent upon defining the objectives of circulation within a particular library.¹

Automated Circulation Systems

The prospect for automated or computerized circulation systems has never been better than it is at this moment, and over the next few years, the prospect can be expected to improve materially as new equipment with greater capabilities becomes available at costs which are reasonable for libraries to bear.²

Despite its timeliness, this statement was not made in 1978 but in 1967 at the Preconference Institute on Library Automation. Record maintenance in the circulation procedure can be easily accomplished with the aid of computerization. The circulation system is often the first operation within a library to be automated because of its highly repetitive routines and need for numerous statistical data. In order to obtain a greater understanding of the circulation subsystem of the District's new system, it is necessary to review the overall objectives of any circulation procedure as a foundation upon which to build before examining previous systems with the District.

¹Ibid., p. 7.

²C. D. Gull, "Automated Circulation Systems," Preconference Institute on Library Automation, Library Automation: A State of the Art Review (Chicago: American Library Association, 1969), p. 138.

Functions

Within any library system reliable information concerning the location of materials is a basic necessity. If materials have been borrowed from the library it is important to know first which items are out and secondly by whom. The primary objectives of a circulation control system are to "record and control the use of all kinds of library materials . . . guide the continuing provision of library materials or the continuing growth of the collection . . . [and] guide the continuing growth and improvement of library services."¹

In order to meet these objectives to operate in an effective manner, the circulation system must perform and maintain five major functions which are (1) provision of information service to borrowers; (2) control of borrowers; (3) control of material; (4) control of records; and (5) control of loan periods.²

Provision of information service to borrowers is the first function of a circulation system. Elements included within this phase are patron and book status information. This function indicates to the patron material charged to the individual's record while also

¹Ibid.

²Ibid., pp. 139-44.

providing information as to an item's location and any holds or reserves placed on it. Closely related to this function is the control or registration of borrowers. This entails the formulation of files and crossfiles of those individuals eligible to borrow material while at the same time indicating any limitations which might be placed upon their borrowing privileges.

The third major function is the control of materials. This can be further subdivided into charges, discharges, and renewals. To charge an item requires the bringing together of information about the item, the borrower, and the loan period. The discharge mode employs the same elements to cancel the record. In conjunction with the control of materials, records must be maintained or updated through the interfiling of newly created charges, cancellation of charge records, and alternate loan periods.

The control of loan periods, or the procedure required to accomplish the return of overdue items, comprises the fifth function. Involved within this operation is the search for overdue items, preparation of notices for mailing or other types of delivery, and preparation of lists by either borrower, materials, date, or all the above.

If the library charges fines for late materials, then a sixth function would be the accounting of fines collected.

District Circulation Systems

The majority of pre-1970 circulation system developments were offline batch-processing. The most widely used automated equipment to record book, borrower, location, and date data was the IBM 357 Data Collection System.¹ The IBM 357 was the first computerized circulation system employed by the District. This system used a borrower's laminated, punched card and an 80-column book card. The book card contained punched data such as the call number, author, title, copy number, and media code. These two items were then inserted into designated slots in the machine. An 80-column transaction card, which was used for computer input, was produced via a cable connected IBM 026 Printing Card Punch either at the charge station or in a remote location.² One of the problems inherent in this particular system was its inability to produce charge and discharge transaction cards in one operation. When an item was loaned the 357 "read" the data while the "slave" 026 printer produced a charge card. However, this procedure

¹Ibid., p. 141.

²Ibid.

was required again when the item was returned. The probability of error in producing an exact duplicate was therefore heightened.

When the District enlarged its facilities to three campuses in 1970, the decision was made to go with the Standard Register Source Record Punch. This system had the advantage of being a self-contained unit capable of producing both a charge and discharge card using the book card and borrower identification card. If any error occurred, the same error was therefore duplicated in both the charge and discharge card.

Both systems offered computer generated overdue notices plus daily and cumulative circulation statistics. The Standard Register proved to be a more efficient system than its predecessor. The duplication of effort in producing charge and delete transaction cards was handled in the self-contained system.

When originally installed, the offline system was compatible with the District's operations. But as the community college system grew throughout the county, the District's Computer Services converted to an online system. The net result was that the Learning Resources Centers (LRCs) were the sole users of the "batch" mode with the lowest priority.

The nature of the offline system posed a problem to the LRCs. Information concerning transactions experienced a time-lag of a couple of days between the time transaction cards were mailed to the receipt of the computer printouts. In addition, the potential for loss or damage of cards in transit did exist primarily due to the nature of the operation.

Because of the incompatibility of the two systems, investigations and plans were initiated for the conversion to an online information system.

CHAPTER IV

AUTOMATED LIBRARY INFORMATION SYSTEM

In September 1977, the Automated Library Information System (ALIS) became partially operational on two campuses within the Dallas County Community College District (DCCCD). The design and implementation, a joint effort on the part of the District and DataPhase Systems, Inc., presented the library community with a new dimension and alternative approach to vendor-supplied packaged systems.

ALIS represents what has come to be known as the total systems approach.

This approach was based on the premise that since a library is a single complex operating system and all its varied operations are interrelated and interconnected, logic demands that it be treated as such and that a single integrated or total computerized system be designed for it.¹

Traditionally, library automated systems were designed in a piecemeal fashion. Crisis areas such as circulation, cataloging, or serials were automated as separate entities with little regard to the overall analysis of information flow.

¹De Gennaro, "Library Automation: Changing Patterns and New Directions," p. 177.

Part of this lack of an integrated approach reflected the state of the art. Technology was still in the experimental stages and although the concept of an integrated approach existed, the cost outweighed the benefits. This approach had been tried as early as the mid-1960s at Chicago and Stanford. The technology was not as sophisticated as it needed to be in order to complete the project at a reasonable cost.¹ A second hindrance in the process was the lack of vendor-packaged information systems. Vendors in the late sixties and early seventies focused their attention on isolated areas. But for new vendors breaking into the market, it becomes essential for their survival that they design a marketable product which integrates all the functions into a single unit.

ALIS exemplifies this current trend in library automation. Not only is it a total systems approach, but it departs from the homegrown developments, to that of a vendor-supplied system, one which utilizes an off-the-shelf minicomputer capable of interfacing with bibliographic networks such as the Ohio College Library Center (OCLC).

¹Ibid.

Systems Development

As early as 1972, an online automated information system had been discussed. The impetus to undertake the project revolved around the opening of the last three projected campuses within the District, of which two would open in the Fall of 1978. Their opening required a circulation system of some nature and magnitude, batch or online, to be funded and implemented prior to opening. Another factor influencing the decision was the replacement costs of the current equipment which was outdated and wearing out. Based upon a cost estimate prepared in 1976, \$41,600 would be required initially for implementation of the offline circulation system with an additional outlay of \$30,294 per year. In lieu of this expenditure, the administration supported the preparation and eventual conversion to an online design to be operational by the Fall of 1977.

Early in the developmental process, the decision was made to proceed with the total systems approach. In the bid specifications drawn up for the DCCCD, the Automated Information Resources System (AIRS) proposed to incorporate the seven library functions, circulation, reference, acquisitions, technical services, bibliographic control, serials, and master holdings update into an integrated file

utilizing the minimum number of files with a maximum inquiry output. At this time the decision was also made to use optical character recognition (OCR) for the pressure sensitive labels and the patron identification cards. The concern throughout the systems development was not to become locked into an unexpandable system. Experience had often shown that systems, once approved, funded, and designed, were outdated by the time they became operational. The design for the District's system was to be innovative and futuristic.

On the basis of these objectives, bid specifications for AIRS were begun in November 1976 and completed roughly two months later. By March 1, 1977, a contract was negotiated and awarded to the lowest bidder DataPhase Systems, Inc. of Kansas City, Missouri. Their response proposal, ALIS, an Automated Library Information System, paralleled the District's concept of a total integrated approach. ALIS was designed to meet the library community's needs for an automated information system. As a new vendor in the library automation market, DataPhase Systems was in need of a pilot project.

DataPhase Systems, Inc. was formed December 1, 1975. The owners, experienced in the areas of computer and bar code technology, saw a market for the OCR method of

capturing data in library automated systems. Prior to the systems development, libraries and librarians were queried to determine the automation needs. From this investigation resulted the Automated Library Information System.

Although DataPhase Systems' first project at DCCCD has been operational less than nine months, DataPhase Systems has already made an impact within the library community. As of April 1978, contracts have been awarded to supply systems for all the public libraries in the State of Washington, all public libraries in North Carolina, Wichita Public Library, Houston Public Library, and Oral Roberts University.

Despite its youth, DataPhase Systems has proven its system is functional and more importantly, flexible. Although it offers a packaged or "turnkey" design, libraries may customize the package to meet their needs. The system demonstrated across the nation is the design in operation in Dallas. ALIS was designed for the DCCCD and is not limited to one set of functions. If a library needs full MARC records for expansion into state and national bibliographic networks, the programs can be altered. Another facet of ALIS is the OCR advantages. Still another benefit is inquiry by subject headings. More importantly, DataPhase

Systems offers an alternative in a market which has been monopolized by one or two library vendors.

Future Developments

Implementation of the circulation and cataloging subsystems are only the first chapter in the total expansion planned for the Automated Information Resources System (AIRS) and the Automated Library Information System (ALIS). At the present time, the two systems are synonymous, with the Technical Service Center (TSC) assisting DataPhase Systems in the debugging process. After completion of the pilot project, AIRS will be allowed to develop in areas deemed necessary to meet the District's needs, while continuing to receive benefits from ALIS's expansion plans.¹

The data captured in the item file, currently used in connection with the circulation and cataloging functions, can be expanded and reorganized to develop files in other areas. One of the first additional subsystems to be completed will be that of acquisitions, which should be operational by September 1979.

Future anticipations for the system include materials book-in and inventory control. Materials book-in

¹The software warranty states that the DCCCD will receive all software and future modifications, as long as licensed. The license fee will be \$1.00 per year.

will allow for the receipt and distribution of films and other audiovisual materials. DataPhase Systems also plans an inventory control process. Through the use of a portable OCR Wand scanner taken into the stacks, each item's accession number will be read and later transmitted online to the computer. These data should reveal not only items missing from the collection, but also weaknesses within the various disciplines.

Hardware and Software Capabilities

The DataPhase Systems' online Automated Library Information System (ALIS) utilizes the computer facilities of the Technical Services Center (TSC) of the DCCCD. In conjunction with the automated system, the TSC is responsible for maintaining the online system by means of operating programs, maintaining computer equipment, providing systems analysis and documentation, and providing the interface persons.

At the TSC, the Data General Nova 3-D minicomputer provides online service to the LRCs. The link between the minicomputer and the console terminals is the telephone system with Vadic modems. The system is designed for continuous operation twenty-four hours a day.

The following is a list of the hardware required to operate the system:

<u>Quantity</u>	<u>Description</u>	<u>Model</u>
1	Computer	Data General NOVA 3-D
1	Disk Drive	Data General 6061
1	Tape Drive	Data General 6021 (Mag Tape Subsystem)
2	Multiplexors	Data General ALM-8
12	CRT displays	Data General 6053-FA
1	Console Printer	Data General 6042-DA
1	Forms Printer	Diable 1620 Hyterm II (Xerox)
16	Modems	Vadic VA1230K
12	OCR Wands	Recognition Products, Inc.
12	Data Cassettes	Techtran Industries 815 Datacassettes
12	Small printers	Micro Peripherals, Inc., MP-40

The online system is a multi-tasking message-processing series of programs, with the capability of running twenty-three tasks simultaneously.

The operating system uses a high level, English-like interpreting language called MIIS. MIIS is derived from MUMPS (Massachusetts General Hospital Utility Multi-Programming System). MIIS is "especially useful for applications that involve library bibliographic systems . . . and local staff can maintain the program if desired."¹ This allows a programmer to "write a program, debug it, edit it, run it, and modify concurrently in an interactive session at a CRT console."² In elementary terms, MIIS

¹"CLSI Faces New Criticism and New Competition," Library Journal 103 (February 1, 1978): 304.

²Proposal for an Automated Information Resources System (Kansas City, Missouri: DataPhase Systems, Inc., 1977), p. 40.

allows maintenance or modification of a program more easily than with some of the other languages.

The data files are organized in a hierarchical, tree-like structure. The files contain any number of levels, each pointing to a segment of stored data. DataPhase Systems' allows for fixed and variable fields. With this flexibility information which is stored in the variable-length fields does not waste valuable disk storage space for information fields not used. The disk data are highly nonsequential in that information blocks on one level may not be in close proximity to a "parent" block. Storage of data on the disk is determined by the operating system to minimize access time caused by rotational delay of the disk pack and the placement of the disk head.¹

The system can handle 40-45 terminals with a single minicomputer,² although the DCCCD plans for only 30 terminals. The system proposes to easily handle the DCCCDs requirements for a minimum of five years. Typical response time averages two seconds and should never exceed five.

¹Automated Library Information System: General Systems Development (Kansas City, Missouri: DataPhase Systems, Inc., c1977), n. p.

²"CLIS Faces New Criticism . . .," p. 304.

OCR Technology

Optical character recognition (OCR), while not new in business or industry, has recently surfaced in library automation as an alternative method of capturing and transmitting data. OCR represents a technological advancement over the bar code format.

Bar codes and OCR machine-readable labels have similar characteristics. For instance, they can be affixed to all types of items, be it books or equipment; they do not necessitate removal for purposes of charging or discharging; they are not as subject to damage or mutilation as punched cards; they do not require book pockets or holders; and they are well suited for accession numbers or an identification number. Some of the disadvantages common to both formats are that they are not suitable for input of long strings of data and the labels may need to be covered with a transparent lamination to protect them from damage.¹

OCR combined the positive advantages of bar code technology but eliminated the printing problems associated with bar codes.² Bar codes were too limited and seemed to

¹Markuson, p. 18.

²Automated Library Information System: General Systems Development, n. p.

be peaking, whereas "OCR was the thing of the future; a positive note on the upswing."¹ Monetary considerations also favored OCR as opposed to bar codes. OCR was cheaper to produce. Labels could be produced in one of two ways, either by inputting the character spontaneously into an IBM Selectric typewriter using an OCR-A type element or produced by computer. However, bar codes are restrictive and unflexible because they are assigned and printed codes. OCR offers another advantage over bar codes since it is readable to the eye.² However, it should be noted that OCR technology is relatively new in library automation and is still in the experimental stages.

OCR Wand

The OCR Wand is a hand-held device used to read unit records from a human-readable source (OCR-A format). The use of this device eliminates manual keying of data for computer input. Data are read by passing the wand over the information, either left-to-right or right-to-left, to lift the images from the page. This information is then

¹From correspondence and telephone conversations with Paul Dumont, Technical Service Center Director, DCCCD.

²Ibid.

recognized, edited, and transmitted to the data recording device to which the OCR Wand is interfaced.¹

As the Hand-Held Module or wand is brought together with the line of information, the lamps in the wand automatically switch from "dim" to their brightest intensity. When "wandering" is complete, the lamps automatically dim to extend the life of the bulbs. Another feature of the wand is the read indicator light, a light-emitting diode (LED) which, when illuminated, indicates the "system" is "Busy." When the system is free to receive additional data the Busy light is extinguished.²

The quality and format of the labels influence the ability of the OCR Wand to successfully read the data input. Upon a successful scan, an audible tone and visual indicator (LED) provide the necessary feedback.

Functions

The Automated Library Information System (ALIS) does more than simply fulfill the needs of the circulation librarian. DataPhase Systems offers the flexibility for libraries to create a desirable automated environment. ALIS has the capability of meeting the more traditional

¹Proposal for an Automated Information Resources System, p. 29.

²Ibid., p. 32.

aspects of a library, but in addition, offers subject access for state and national bibliographic resource sharing.

As of April 1978, ALIS was operational to the individual campuses in three areas: charge, discharge, and inquiry. Other areas such as holds, reserves, renewals, and blocks (for academic purposes) should be available before the end of May. The following areas describe the general system capabilities of ALIS with the heaviest concentration on the circulation subsystem.¹

Charge

The charging procedure occurs through the interaction of the terminal keyboard and OCR wand. The appropriate charge function is selected by the operator and the patron identification number, encoded with the OCR ID number, is input. Each library item is also encoded with an identifying accession number printed in OCR type font. Both OCR numbers uniquely identify each patron or library item. Any information the wand "reads" can also be manually input on the keyboard.

Prior to charging out items, the computer searches the appropriate patron files to check the individual's

¹Automated Library Information System: General Systems Description, n. p.

status to determine that there have been no abuses or blockages. Within this procedure, the system checks the patron's eligibility to borrow items from the library, delinquency, expiration of privileges, attempted usage of a lost or stolen ID card, or any other reason the library chooses to incorporate. If any of this information is present in the student's file, the information is displayed on the CRT (cathode ray tube) screen.

The system specifies the number of items to be circulated to any one user. The system stores the number of items circulated to a patron in its memory. Therefore, if a patron attempts to borrow more than the specified amount, an appropriate message will appear on the CRT display.

When an item number is entered, the system will search the files to make certain the number is valid, not already in circulation or that no holds have been placed on it by another patron.

The final step in the circulation process is the assignment of the loan period based upon the type of material and the patron classification. The loan period is calculated at the time of the circulation by the system and can therefore be as complex as the library wishes or as simple as the standard loan period. For example,

reserve materials might have a two-hour period or a faculty member might request loans through the end of the semester.

The system also has the capability of allowing multiple charges to a patron, without necessitating re-entering the patron's ID number for each transaction and the ability to provide multiple circulation periods according to the item's classification.

In the event of a restriction, the system will signal the operator with an audible "beep" and visual message on the CRT screen, requiring some type of action before proceeding.

Discharge

The discharge or check-in procedure deletes the item from the circulated status and updates the item file to an available status. This is accomplished by wand reading the OCR accession number. Should the label become disfigured or torn, inquiry into the system will produce the entry information. When an item is checked in, the system will verify the accession number and check for a reserve or hold. Again, as in the case of charge, if one of these conditions occurs, the operator is alerted by an audible "beep" and visual message on the CRT screen.

The system is also capable of invoking fines automatically should the library have such a policy. In the case of the DCCCD, fines are not invoked; therefore, this function is not available.

Renewals

Renewals of library materials are handled in much the same manner as the charge function. When an item is renewed the appropriate files are updated to indicate the adjusted due date. A renewal may be prohibited if the item has been requested by another patron or library.

Hold Procedure

The hold procedure is the process through which a patron may request an item that is already in circulation. Much the same procedure occurs as in the charge function. The patron's ID number is scanned and the accession number of the item is entered manually, as the item is not available to be scanned. If the number is unknown, the other search keys within the system can be utilized to determine the number. At the time a hold is placed, a hold record is created which indicates the item, patron, date, and cut-off date.

If the item is in circulation, the item's record will be flagged for hold status which is indicated in the

discharge function. The system will generate a notice informing the patron that the item is available. If the item is not picked up within the specified amount of time and another hold is on the item, an availability notice will be generated for the next patron and the item will not appear on the clearance report. As with the other functions, individual holds can be manually cancelled by the operator. Items not found in the collection and not shown in circulation can be input as missing.

Reserves

Reserves are those items segregated within a library collection. Reserves are most commonly found in an academic library. Many of the items may be personal copies which an instructor has made available to his/her students. These items may be handled outside the normal procedures by assigning the appropriate information required, such as an arbitrary accession number and enough descriptors for control purposes. Because of their special nature, reserves may use the alternate due date for hour loan periods.

Overdue Control

The system has the capability of automatically generating reminder notices for materials which exceed the

date established by the library. In the case of the DCCCD a maximum of three notices can be issued, a first and second notice and a final notice at the conclusion of the semester.

Inquiry of Files

ALIS is accessible for inquiry in a variety of ways. The item file may be searched by the title, accession number, Library of Congress call number, author(s) and subject(s). The inquiry procedure is accessible as either a separate function or as a subroutine under the charge function.

Through this process a library can query the file for the current status of any item at that location or any location within the district or common data base, permitting increased intra-library loans. Another facet of the inquiry mode will be the ability to perform a combination subject search using the conjunction "and."

Inquiry into a patron's file is accomplished by entering the patron's number (e.g. Social Security Number) or patron's name. Any portion of the name may be entered for a search and a list of all patrons corresponding to this information is given. For example, if the attendant was searching for Sarah Ferguson, FERG could be entered and every patron within the data base meeting these qualifications would appear on the CRT display in groups of ten.

Branch-to-Branch Communication

This function allows libraries within the District to perform intra-library activities. Present within this area is a double level charging ability. In essence, this means Campus 4 can loan an item to Campus 8, which in turn circulates the copy to an instructor on that particular campus. A daily report of this type of activity will be sent to the various campuses. Very few systems provide a double charging level.

Temporary Cataloging

Within the system, provisions have been made for those materials which are not cataloged for entry into the master holdings file, such as an instructor's personal material placed on reserve. To accommodate this special material, accession labels will be generated by the TSC. This accession number plus the basic bibliographic information will be used to create a record allowing limited circulation. Upon removal, the record will be deleted from the file.

System Reports

Statistical data reflecting system utilization is still in the developmental stages. The following list

represents general categories of reports which will be made available to the libraries and TSC:

1. Statistical Reports
2. Master holdings
3. Circulation
4. Reserve
5. Overdue, missing
6. Patron list

Mailbox

The "mailbox" structure was created to allow campuses to transmit and receive messages online. The storing of messages will not interrupt normal activities either audibly or visually.

Blocks

A block will be placed on a patron who has in some manner abused the privileges of the library. A "block" will prohibit further transactions until removed.

Additional Functions

Several additional functions exist within the system which have a bearing upon the previously discussed functions. These include: master holdings maintenance, file maintenance, notice generation, and system security. The security password provisions determine the functions permitted an operator based on his individual password.

To augment the general functions, libraries have custom designed options. Material codes have been developed to allow a library to designate various forms of circulating and non-circulating materials; such as a code for books, one for phono discs, cassettes, and other forms of media. The file structure also permits multiple locations within the library, such as reference, paperback collections, professional readings, and any other combination.

Multiple patron categories have been provided to serve the District's needs. These include categories for students, faculty members, supportive staff, and special patrons.

Cataloging

Full bibliographic cataloging comprises the second subsystem within ALIS. This subsystem permits the creation or addition of new items to the item file employing a formatted screen into which cataloged data is entered in an interactive mode with the computer. The formatted screen allows the cataloger to query the system to determine the item's existence. If the item is in the data base, updating is performed in terms of either the edition, publisher, date, copy information, or any combination thereof.

CHAPTER V

IMPLEMENTATION OF THE CIRCULATION SUBSYSTEM

Implementation of any system or subsystem is a challenging and sometimes trying period.

In most new systems there is a "cutover" period, the transition between the old and the new. This period is often very painful for all concerned. Service is sometimes poorer than before for a time because personnel are confused and uncertain of what they are doing.¹

A system's implementation is not an isolated element within the total administration of a library. The ramifications are like the ripples in water after a stone is thrown in, they continue to spread to new areas. Conversion from the old form of circulation to the new has been no different in the District than from any other library's conversion with the net result being a dual system of operation.

The Dallas County Community College District (DCCCD), because of past experimentation in automation and subsequent usage of magnetic tapes for storage of master holdings data, eliminated the need to convert records into a machine

¹Gloria L. Smith and Robert S. Meyer, eds., Library Use of Computers: An Introduction (New York: Special Libraries Association, 1969), p. 35.

readable format. The magnetic tapes were input to create the item file. Because this tape represented all records created since the establishment of the District, errors, either cataloging or typographical, did exist and these errors were subsequently transferred to the new system.

The OCR alphanumeric pressure sensitive labels were the first visible sign to the LRCs that implementation of the new system was beginning. The labels are an integral part of the operation of the circulation process; each contains an accession number, the key access to the item master file. Each item is uniquely identified in terms of author, title, and media by a twelve digit alphanumeric accession number. The code in OCR-A font is composed of one alpha and eleven numeric digits with six of the eleven representing the item number, two indicating the edition number, and the remaining three reserved for the copy number. Each item has the potential of having 99 editions and as many as 999 copies for each edition. The assigning of the accession numbers resulted from the matching of items in the master file by author, title, and media. The first match established the code and any additional items became a copy of the original code.

The labels are computer generated from the item file as are a four part set: one large label (pocket label)

which contains the accession number, Library of Congress call number, author, title, and campus identifier; two small labels with the accession number only; and a spine label. (See Diagram 1.) Incorrect data in the item file was visually reflected in the labels.

The OCR-A pressure sensitive labels were computer produced by Creative Computer Services, a Dallas based firm.¹ The initial printing of the labels for the two new campuses, Cedar Valley and North Lake, encountered some difficulty. Approximately 5,000 labels did not adhere properly to the books or book dust jacket covers. In addition, ink smearing was noticeable. Ink smearing rub-off is more than distracting; severe cases could render the labels unscannable. The inability to use the first set required that all the items be relabeled. Creative Computer Services changed the label's adhesive and replaced the Mylar ribbon, originally used in the printing process, with a fabric one. This procedure proved successful and was used for the production of labels for the remaining campuses.

The actual process of affixing the labels to each item was the responsibility of the individual campuses.

¹The label specifications stated the degree to which a label could be removed having once been affixed to an item. The pressure sensitive labels were equivalent to the Avery Destruct Labels.

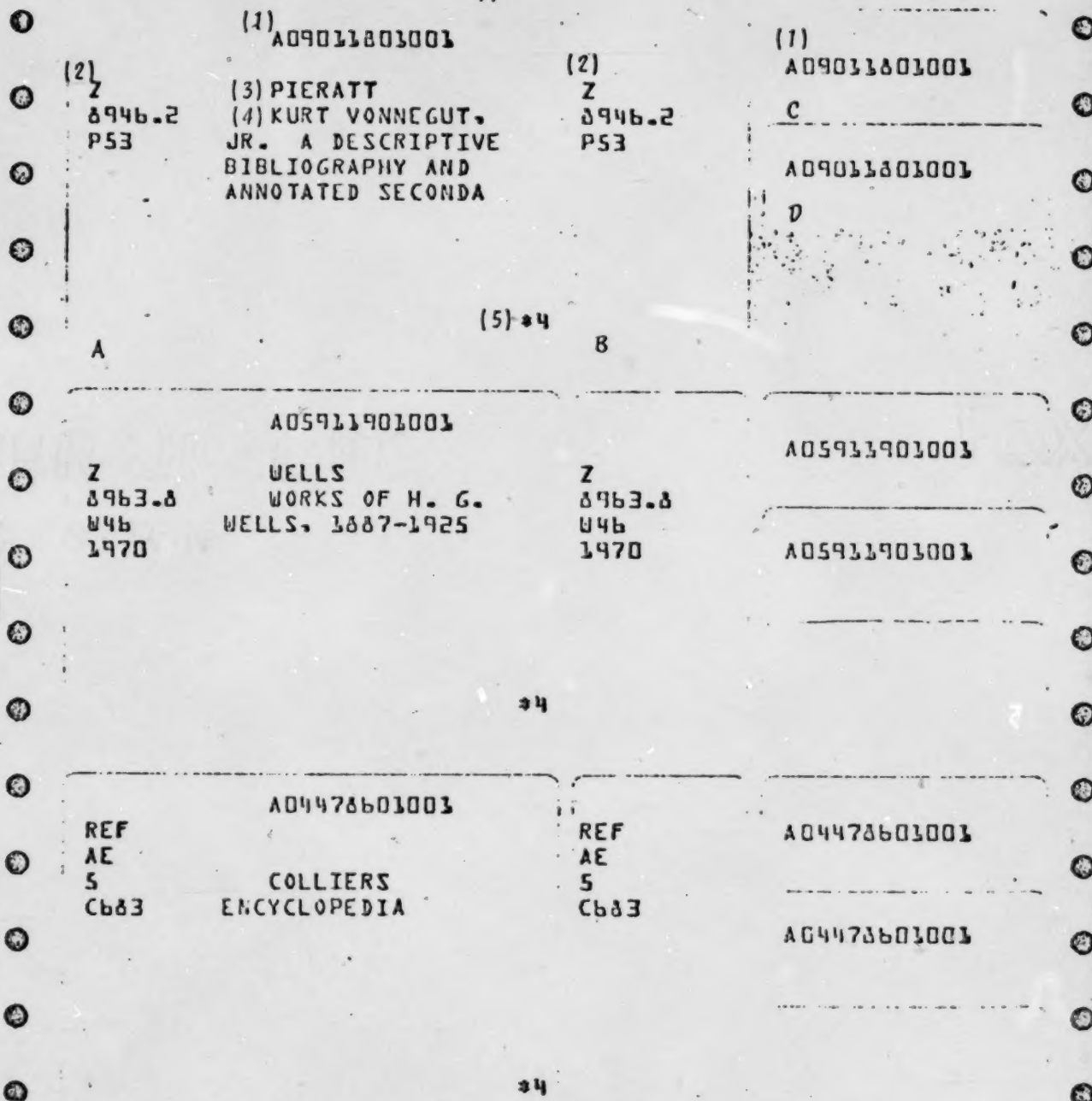


Diagram 1

A = Pocket Label

B = Spine Label

C = Outer Label

D = Optional "Pocket" Label

(1) Accession number

(2) LC call number

(3) Author

(4) Title

(5) Campus Code

In the case of Cedar Valley and North Lake the Technical Service Center (TSC) performed the task due to the critical time factor.

Each campus determined the manner in which the task would be accomplished. One chose to enlist the aid of the student assistants while another chose to employ only library staff members. Labeling 30,000 to 40,000 items on each campus is a time-consuming undertaking. Prior to affixing the labels, careful attention must be given to insure accuracy of the title, author, and LC call number. Error is always a factor in any project such as this, but it can be minimized. If the labels contained an error, they were held aside to be sent to the TSC for catalog correction. Of course, some items were in circulation at the time of labeling and these too will be labeled in the future.

The TSC recommended the placement of the labels; however, each campus made the final decision. The general recommendation was the placement of the larger label on the existing book pocket. An outer accession label could be placed horizontally a quarter of an inch from the upper left-hand corner of the item. The second accession label could be placed on the "pocket" portion of the book pocket; however, this was optional. (See Diagram 2.)

Diagram 2

Information Systems:

Current Developments and Future Expansion

Proceedings of a Special Seminar held
for Congressional Members and Staff

Sponsored by...

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In cooperation with...

THE ASSOCIATION FOR COMPUTING
MACHINERY, INC.

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SYSTEMS CURRENT
DEVELOPMENTS AND
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EASTFIELD COLLEGE
of the
DALLAS COUNTY
COMMUNITY COLLEGE DISTRICT

56

An outer label offers the advantage of allowing the operator to "wand" the accession number quickly without opening the book or item. The outer label will also facilitate inventory, when a portable wand scanner becomes a reality.

A negative feature of the outer accession number is the damage and disfigurement it undergoes. Early in the development process the decision was made, due to the time limitations, not to place a protective lamination covering on the outer label. Many labels, after only a few months time, have become torn and disfigured to the extent that they cannot be scanned successfully. In March, the TSC made the decision to order clear plastic labels for the outer labels. At this time it is not known when the protective coverings for the outer labels will be available. It should be noted that an accession number appears on the label affixed to the inner pocket and if for some reason scanning is still inhibited, the accession number can be keyed in manually.

Another area of frustration concerning the labeling process was the lack of labels for newly processed items. Because of an unanticipated delay in the completion of the cataloging subsystem, the master holdings' magnetic tape could not be updated and the selected labels subsequently

printed. Therefore, labels do not exist for those items processed after October 1977, neither has the microfiche catalog been updated since this date, which means an increased dependence upon the computer printout supplements. Lack of labels also means the continuing of the offline system of circulation. However, this number of items circulated does not comprise more than 10 percent of a day's transactions. The problem is more a source of irritation and some confusion on the part of the desk attendants. The staff does not feel that patrons have suffered any unnecessary delays in service as a result of the dual system.

The second major operation in preparation for the new system was the production of student and faculty laminated identification badges or cards. Two types of cards were employed within the District. The new campuses used one format and the other campuses continued with the style used in previous years. The older campuses, Eastfield and Mountain View, designed their cards for the dual system of operation. The patron's social security number was typed with the OCR-A font but the card also contained the keypunched number for compatibility with the Source Record Punch. At Eastfield each individual was issued a new ID card for the Spring semester. The production of ID

cards was costly. Additional student help was required for the typing, proofing, laminating, and keypunching. A cost study was done revealing the cost lay not in the materials, but in the additional man-hours required to complete the job. As a result, a pilot project will be undertaken at Eastfield in the Fall of 1978 for the computer production of ID cards.

One problem associated with the ID cards was the positioning of the social security number. The old cards had less space for the number to be typed and occasionally the number was typed too close to the line. The result was that a number of cards could not be scanned accurately, thus requiring the identification number to be keyed in manually. (See Diagram 3.)

The proper introduction and training of staff members to the intricacies of a new system can help to eliminate the fears and reservations that often occur during the cutover period. A new system can be exciting but also frightful to those who have never operated a CRT terminal previously. Reactions spanned the entire spectrum; some individuals were skeptical while others abounded with wild enthusiasm and curiosity.

Two individuals from the TSC trained the staff members on each campus as to the capabilities and procedures

Diagram 3

A

BEAST, THE W0000000666

NAME EASTFIELD COLLEGE NUMBER

of the Dallas County Community College District



VALID ☐ WITHOUT PHOTO

Card is property of Eastfield College

71	72	73	74	75	76	77	78
F	F	F	F	F	F	F	F
Sp	Sp	Sp	Sp	Sp	Sp	Sp	Sp
S	S	S	S	S	S	S	S

B

TUT, KING W1111111119

NAME EASTFIELD COLLEGE NUMBER

of the Dallas County Community College District



VALID ☐ WITHOUT PHOTO

Card is property of Eastfield College

71	72	73	74	75	76	77	78
F	F	F	F	F	F	F	F
Sp	Sp	Sp	Sp	Sp	Sp	Sp	Sp
S	S	S	S	S	S	S	S

C

 NORTH LAKE COLLEGE
DCCCD
Identification Card

W0000000007

SOC. SEC. NO.

DREW, NANCY 3

NAME USER CODE

SF	S	F	SP	S	F
78	78	78	79	79	79

D

 CEDAR VALLEY
COLLEGE
DCCCD

I. D. NUMBER N111222333

NAME JULIUS CAESAR

USER CODE 3

- Illustrates both systems with ID number scannable
- Same card but unscannable (number too close to line)
- Format of one new card used with partial lines
- Identification card void of any lines

for operation. A partial rough draft of an operator's manual was made available to the LRCs. After considerable experimentation and consultation with the TSC, the staff has become proficient in the use of the system.

Prior to installation, the college campuses knew that the system was still in the debugging process. Most systems experience some degree of incompleteness during the first year of operation and the DCCGD has been no exception. At the time of this writing only three functions have been made available to the colleges: charge, discharge, and inquiry, and within these some options have not been completed. These incomplete stages are "problems" to the operators, but they do not constitute nor do they reflect poor programming; however, some staff members do grow impatient. By May 1978 the debugging process should be complete.

One problem which did cause some concern was poor response time or turnaround time. The average response time should be two seconds and never exceed five. However, for a period of three or four days the average time was eleven seconds and sometimes as great as twenty. The problem was immediately brought to the attention of DataPhase and after a programming alteration response time returned to normal.

As of yet the portable cassette backup system has not been completed. An engineering delay has been credited with its postponement. The backup system would allow the continued use of the wand if the online system were down for any reason. The same procedure for charge and discharge would be carried out, but the information would be input onto a cassette tape and when the system "came up" the information would be transmitted online to the TSC computer. A related problem can be seen on the two new campuses. Since the Source Record Punch is not available as a backup system, all items without labels must be manually recorded.

Despite the inconveniences, the most important aspect of the operation is functioning as it should. Items are being charged and discharged accurately. To the knowledge of the LRC staffs and the TSC programmers, items charged to a particular patron have not become "lost" and materials returned have been properly deleted from all the appropriate files. Through inquiry an item can be searched to determine if and when it was charged out and if so by whom and from which campus. There has been no cause to doubt or question the system's capabilities nor to rely on a manual system as a "just in case of" outlet.

CHAPTER IV

EVALUATION AND CONCLUSION

Evaluation of a partially operational system is a difficult task. After less than nine months of operation, general observations and recommendations can be formulated, but final judgment is impractical at this time. For purposes of this paper, only those functions available to the college campuses will be discussed in terms of performance standards.

The experiences of implementing and debugging an automated information system are typical occurrences of any new system. The customary transition period was anticipated and therefore has not proven a deterrent to user service. The dual method of circulating materials required attendants to operate two systems.

A noticeable advantage of the Automated Library Information System (ALIS) was the ease of training attendants in its use. Thirty minutes of instruction plus "hands-on" experience provides enough information to circulate and discharge an item. Additional training periods provide in-depth knowledge of the inquiry mode. Operation is basically a matter of pushing the right buttons. As

with any automated system, experimentation and experience have once again proven the best teachers.

- The single most important question asked is "does it work?" To the knowledge of the Technical Service Center and circulation attendants, no cause has been found to warrant a poor report on the system. DataPhase Systems claimed that response time would average two seconds and not more than five and, except for a three or four day period, they have been proven correct. More importantly, items charged to a particular patron are indicated on the appropriate files and of equal significance, when discharged, the items are deleted from the same files.

The optical character recognition (OCR) capabilities allow check-out and check-in of materials in under three seconds. However, quality of the labels scanned has a definite bearing upon the recognition properties. The outer label may require three or four scans before the information is "read." At the time of this writing, the pocket label has shown no signs of smearing or inability to read. A related problem is the production of patron identification cards. The patron number, in this case the social security number, must be typed far enough above the line or it too becomes unscannable. The best solution

would be the adoption of an identification card void of any lines which could hinder accurate scanning.

The capabilities of the system are limited, at this time. The anticipated benefits will not become a reality until total completion. One critical area which will not be completed for several months is the statistical reports. No method within the system can provide daily or monthly reports on usage. The method now employed is an estimate of the number of date due slips used.

The ability to inquire about an item's status within the District has encouraged student and faculty utilization of more than one campus' resources. From an operator's perspective, information is immediate. No longer does the time-lag exist between the transit and receipt of transaction information. The system also allows for stricter control of patron abuses and of non-students who have retained their old ID cards. Past practice has been to validate student cards, but it was easy to forget to check the code, this is no longer so. If the student or faculty member is not within the patron file, circulation is prohibited until a determination of the patron's status is located in other sources (e.g. computer printout of current enrollment), at which point the system may be overridden.

The ability to search the item file by the call number, accession number, any portion of the author or title, and numerous subject combinations has not been fully explored and capitalized upon. As combination subject inquiry is expanded, the system can move from the "quasi-reference" state to a full reader service.

One point which may appear insignificant is the noise factor, or, in this case, the lack of it. One of the first comments made by users is the quietness of the system compared to the Source Record Punch. The library now "sounds" more like a library ought to sound.

No system is perfect, either in its operation or administration. The following recommendations and comments are suggestions not only for the District but for any other library contemplating implementation of a new system.

Planning, development, and implementation of the pilot project for DataPhase Systems was undertaken and accomplished in an extremely short time frame. The plans were formulated in November 1976, and by September 1977, the first two campuses were partially operational. The remaining campuses are being brought into the system as the labeling process is completed.

Despite the desire for all campuses within the District to be online, the question arises, would it not

have been more profitable in terms of time to allow the original two campuses to serve as the pilot project for the system for a full year? The theory being to allow debugging of the system and provide observations as to the durability of the labels before implementation on the other sites. Time was a critical factor, but the time which may be spent in coming months on applying outer protection or affixing new labels to those items processed since October 1977, resulting in a duplication of effort, may have been worth the wait.¹

Another recommendation is the development of an operator's manual for training purposes. To date, a rough draft exists, but it is in need of expansion and revision. Not only should general functions be provided, but also specific sections on solutions to problems which may arise. Such a manual might alleviate the numerous questions which arose concerning details with special functions. The Technical Service Center might wish to prepare such a manual so that it would be consistent throughout the District, rather than allowing each LRC to formulate their own.

¹The author recognizes that factors may have existed which required immediate implementation; however, these conditions were not disclosed in conversations with the TSC.

One final recommendation would be the preparation of a more in-depth study of the automated information system three years from now. At this point in the development, too much remains inaccessible to the campuses for a comprehensive analysis. The debugging period often focuses upon the problems encountered rather than on the positive advantages.

In conclusion, DataPhase Systems' Automated Library Information System (ALIS) offers technological advantages above the other bids submitted at a substantially lower cost (\$70,000 lower than the closest bidder). These advantages include an ability to upgrade the disk storage at a lower cost,¹ an ability to handle up to 40 console terminals with one minicomputer, optical character recognition (OCR) qualities, subject access, temporary cataloging, double charge-out abilities, and the greatest flexibility in both data base management² and library customized designs.

Despite the advantages and projected subsystems, one cannot overlook DataPhase Systems' lack of experience in the library environment. For this reason, the success

¹"Consultants Report Submitted by Blackwell North America, Inc., Evaluation of Responses to TPL 7603," 17 May 1977, p. 9. (Mimeographed.)

²Ibid., p. 24.

of the pilot project with the Dallas County Community College District takes on added significance. ALIS and its counterpart in the DCCCD, AIRS, has the potential for expanding library automation not only within a district, but also on a state and national level. ALIS and AIRS truly represent the fourth generation of library automation.

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